

## **6. Subscribership and Penetration**

The number and percentage of households that have telephone service represent the most basic measures of the extent of universal service. Continuing analysis of telephone penetration statistics allows us to examine the aggregate effects of Commission actions on households' decisions to maintain, acquire or drop telephone service. This section presents comprehensive data on telephone penetration statistics collected by the Bureau of the Census under contract with the Federal Communications Commission. Along with telephone penetration statistics for the United States and each of the states from November 1983 to November 1999, data are provided on penetration based on various demographic characteristics.

The most widely used measure of telephone subscribership is the percentage of households with telephone service -- sometimes called a measure of telephone penetration. Prior to the 1980s, precise measurements of telephone subscribership received little attention. Traditionally, telephone penetration was measured by dividing the number of residential telephone lines by the number of households. Measures of penetration based on the number of residential lines, however, became subject to a large margin of error as more households added second telephone lines and more consumers acquired second homes. By 1980, the traditional penetration measure (residential lines divided by the number of households) reached 96%, while the number of households reporting that they had telephones in the 1980 census was 92.9%.

Recognizing the need for precise periodic measurements of subscribership, the Commission requested that the Bureau of the Census include questions on telephones as part of its Current Population Survey (CPS), which monitors demographic trends between the decennial censuses. This survey is a staggered panel survey in which the people residing at particular addresses are included for four consecutive months in one year and the same four months in the following year. Use of the CPS has several advantages -- it is conducted every month by an independent and expert agency, the sample is large and the questions are consistent. Thus, changes in the results can be compared over time with a great deal of confidence.

Unfortunately, the results of the CPS cannot be directly compared with the penetration figures contained in the 1980 and 1990 decennial censuses. This is due to differences in sampling and survey methodologies and because of differences in the context in which the questions were asked. The 1990 decennial census reported 94.8% of all households in the United States had telephones, whereas the CPS data showed a penetration rate of 93.3% for 1990. This difference is statistically significant and appears to indicate that the CPS value may be on the low side and the decennial census value may be on the high side, with the truth lying somewhere in between.

The specific questions asked in the CPS are: "Is there a telephone in this house/apartment?" and, if the answer to the first question is "no," this is followed up with, "Is there a telephone elsewhere on which people in this household can be called?" If the answer to the first question is "yes," the household is counted as having a telephone "in unit." If the answer to either the first or second question is "yes," the household is counted as having a telephone "available." Although the survey is conducted every month, not all questions are asked every month. The telephone questions are asked once every four months, in the month that a

household is first included in the sample and in the month that the household re-enters the sample a year later. Since the sample is staggered, the reported information for any given month actually reflects responses over the preceding four months. Aggregated summaries of the responses are reported to the Commission, based on the surveys conducted through March, July, and November of each year. These reports are generally released a couple of months after the final month of each four-month survey period.

The Census Bureau data are based on a nationwide sample of about 48,000 households in the 50 states and the District of Columbia. (The CPS does not cover outlying areas that are not states, such as Puerto Rico, Guam, the Virgin Islands, and the Northern Mariana Islands.) Because a sample is used, the estimates are subject to sampling error. For the nationwide totals, changes in telephone penetration between consecutive reports of less than or equal to 0.5% may be due to sampling error and cannot be regarded as statistically significant. As explained below, when comparing the same month in two consecutive years, changes of less than or equal to 0.4% are not statistically significant. When comparing annual averages, changes of less than 0.3% are not statistically significant. The annual averages are the average of the three surveys of the year in question. For individual states or other subgroups of the U.S. population, the amount of sampling variability is much greater, because the sample sizes are smaller.

The data in this section are not seasonally adjusted. Seasonal analysis of the data indicates that, for the nation as a whole, there is no significant seasonal variation in these data.

Census Bureau figures for November 1999, the most recent data available, show that the percentage of households subscribing to telephone service is 94.1%, which is down 0.1% from November 1998. The average penetration rate for 1999 was 94.2%, which is up 0.1% from the 1998 average. These changes are not statistically significant. As a result of an increasing number of households, 1.1 million households were added to the nation's telephone system between November 1998 and November 1999.

This section includes figures showing subscribership percentages by state, by householder's age and race, by household size, by income, and for adult individuals by labor force status. The November 1999 data show that 95.1% of adult individuals in the civilian non-institutionalized population have a telephone in their household. This figure is up 0.1% from the November 1998 level. The average penetration rate for 1999 was 95.2% for adult individuals, which is up 0.1% from the 1998 average. These increases are not statistically significant.

This contains twelve tables and eight charts presenting penetration statistics for various geographic and demographic characteristics. The charts and the first two tables present summaries of the available information. Tables 6.3 through 6.7 present more detailed information. In these tables, only the annual averages are included for the years 1984 through 1996. March, July, and November data for those years are available in Monitoring Reports in CC Docket No. 87-339. Tables 6.8 through 6.12 provide information necessary to determine the statistical significance of changes in the penetration rates over time.

Table 6.1 summarizes the telephone penetration for the United States, combining information on the number of households with the penetration rates.

Chart 6.1 depicts the nationwide penetration rates for households graphically over time.

Table 6.2 summarizes the telephone penetration rates by state, showing the average 1984 and 1999 values, the change between those two years, and an indication as to whether that change is statistically significant. The statistical significance of a change is determined not only by the magnitude of that change, but also by the sizes of the samples used to estimate the change.

Chart 6.2 depicts the states with average 1999 penetration rates more than 1% below the national average, within 1% of the national average, or more than 1% above the national average. It is based on the data in Table 6.2.

Chart 6.3 depicts changes in household penetration rates by state between the average 1984 and 1999 values. States with statistically significant increases or decreases are shown, along with other states with increases or decreases. It is also based on the data in Table 6.2.

Chart 6.4 depicts the relationship between telephone penetration and household income, using average 1999 penetration rates, for all households, and for households headed by white, black, and Hispanic persons. It is based on the data in Table 6.4.

Chart 6.5 depicts the relationship between telephone penetration and household size, using average 1999 penetration rates, for all households, and for households headed by white, black, and Hispanic persons. It is based on the data in Table 6.5.

Chart 6.6 depicts the relationship between telephone penetration and householder's age, using average 1999 penetration rates, for all households, and for households headed by white, black, and Hispanic persons. It is based on the data in Table 6.6.

Chart 6.7 depicts the relationship between telephone penetration and labor force status for civilian non-institutionalized adults, using average 1999 penetration rates, for all households, and for white, black, and Hispanic persons. It is based on the data in Table 6.7.

Chart 6.8 depicts the nationwide penetration rates for civilian non-institutionalized adults graphically over time. It is also based on the data in Table 6.7.

Table 6.3 shows the CPS responses for the United States and for each state beginning with November 1983. Because the CPS began collecting this data only in 1983, comparable values are not available prior to November 1983. For each of the surveys, the column headed "Unit" indicates the percentage of households for which there is a telephone in the housing unit. The column headed "Avail." indicates the percentage of households which have telephone service available for incoming calls, either in the housing unit or elsewhere.

Table 6.4 shows the nationwide penetration rates for households by income and the race of the householder. It shows a strong relationship between income and penetration. Caution should be taken in comparing these figures over time, because these income levels are not adjusted for inflation. Thus, the same nominal income level at two points in time will reflect

different real incomes in terms of purchasing power. Also, the income categories have changed over time due to the changing value of the dollar.

Table 6.5 shows the nationwide penetration rates for households by the size of the household and the race of the householder. It shows that penetration is higher for households of 2 to 5 people than it is for single-person households or those with 6 or more people.

Table 6.6 shows the nationwide penetration rates for households by the age and race of the householder. It shows that the penetration rate is lowest for young and non-white households.

Table 6.7 shows the nationwide penetration rates for all persons that are at least 15 years old in the civilian non-institutionalized population by their race and employment status. Since this table is for individual adults rather than households, the total penetration rates are different from those in the previous tables. It shows that penetration is lowest among the unemployed.

Tables 6.8 through 6.12 present the critical values at the 95% confidence level for testing the statistical significance of changes over time in the earlier tables. These critical values are relevant because changes less than or equal to the values shown are likely to be due to sampling error and thus cannot be regarded as demonstrating that a change in telephone penetration has occurred. In some cases these critical values are very large because the sample sizes are very small for these subcategories, rendering the estimated penetration rates unreliable. Because there is an overlap of half of the sample from year to year, but no overlap in the sample between surveys that are four months apart, annual changes are less subject to variations in sampling error. Consequently, the critical values should be multiplied by 0.8 when making a comparison for the same month in two consecutive years. When comparing the annual averages, the critical values should be multiplied by 0.5774, since these averages are based on three surveys and hence have a lower standard error. When comparing annual averages of two consecutive years, the critical values should be multiplied by .46, taking into account both of the above factors.

#### Policies to Promote Subscribership

We conclude this section with a status report of preliminary research at the FCC on the impact of policies designed to increase subscribership, including the Lifeline, Link Up policies and "do not disconnect" policies.

As discussed in section 2, in 1984 the FCC, in conjunction with the states, established a Lifeline program to promote universal service by helping low-income individuals afford the monthly cost of telephone service. In 1987, the FCC adopted Link Up America, which was designed to help low-income households pay the costs of connection and installation.

In addition, 21 states have implemented a policy where local telephone companies are prohibited from disconnecting their consumers from the local telephone network as long as the consumers pay the local portion of their telephone bills. Such a policy is called a "do not disconnect" (DND) policy. Although it might seem odd that a local telephone company might disconnect some of its customers from its network while those customers are paying their local

charges, many local telephone companies historically have done so. Local telephone companies traditionally billed their customers for local service as well as for long distance service provided by AT&T. With the development of competition in the long distance industry, local telephone companies began to bill for other long distance carriers as well. Most local telephone companies continue to act as billing agents for long distance carriers, and many local telephone companies bill for other services too, including enhanced services, pay-per-call services (900 and 976 numbers) and even services such as psychic services. Local telephone companies make excellent billing and collection agents for three reasons: they send their customers a bill every month, for years, their operating systems are designed to collect for others, and the demand for local telephone service is very strong.

If a local telephone company is unimpeded by a state DND policy, it can present its customer with an ultimatum: either pay the phone bill in its entirety (local charges plus long distance and other types of charges), or be disconnected from the network entirely. The consumer may not be given the option of paying just the local charges, which would allow the consumer to remain connected to the local network. If the local telephone company allowed the consumer to remain connected to the local network, but blocked the consumer from making toll calls, the consumer would still be able to make local and emergency calls, and receive long distance calls. Because many consumers cannot pay their entire phone bill, they become disconnected from the network, even though they could pay their local telephone charges.<sup>1</sup>

In states with a DND policy, consumers that pay the local portion of their bill<sup>2</sup> cannot be disconnected from the local telephone network. The long distance or other companies with unpaid charges can, of course, discontinue their services to those customers who don't remit payment. Typically the customer will enter an arrangement, such as toll blocking, to prevent further use of the services unpaid for, until they are paid.

Most of the data for this study comes from the March 1998 Current Population Survey. The survey respondents were asked a series of demographic questions, and whether or not there was a telephone in the household. CPS interviewers asked questions of 50,353 households in all 50 states and the District of Columbia, including 242 different Metropolitan Statistical Areas (MSAs), as well as those living outside of MSAs.

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<sup>1</sup> Some states have a "soft dialtone", which is a dialtone that allows people with disconnected phone service to call 911, and to call the local telephone company so that service can be re-established.

<sup>2</sup> In some states with a do not disconnect policy, the local telephone company has discretion on how to apply any funds that the consumer remits, unless the consumer specifies which portion of the bill is being paid. In such states, the local telephone company may decide to prorate any payment evenly across all charges. Upon finding that the local telephone charges were not paid in full, the local telephone company may then lawfully decide to disconnect that consumer, even though the consumer has sent the local telephone company sufficient money to cover the local charges on the bill.

Pricing information for telephone service was obtained from *Reference Book*.<sup>3</sup> The Industry Analysis Division conducts an annual survey of telephone rates for local service in 95 urban areas of the United States. The Industry Analysis Division surveys the same 95 urban areas that the Bureau of Labor Statistics surveys for the CPI. The telephone prices provided in *Reference Book* include surcharges and taxes. *Reference Book* also lists Lifeline rates and Link Up rates.

The CPS demographic data were carefully matched to the *Reference Book* pricing data. For the CPS data, the city in which a household resides can be determined only if the household is in one of 242 Metropolitan Statistical Areas. If the household is not in an MSA, then only the state in which the household resides is known. Even when the household resides in an MSA, the exact city in which the household resides is not always known, because MSAs are large regions that include many different cities. For instance, the Washington, DC MSA includes nearby cities in Virginia and Maryland. Because telephone prices frequently differ among cities within the same MSA, the pricing data from *Reference Book* were used only when the name of the central city listed in the CPS data matched the city name from the *Reference Book* data. Pricing data were available 8,408 households. There were no accurate pricing data for the remaining 41,945 households.

The answer to the question of whether or not a telephone was in the household was regressed, using a logit model,<sup>4</sup> against the relevant income and demographic data from the CPS, and where available, the price data from *Reference Book*. The data included income source data (such as dividend, wage, rental, and farm incomes), as well as a measure of the household's total income. For each household, total income was divided by an estimate of the poverty level for that household.<sup>5</sup> Also, several welfare measures were included, such as whether anyone in the household received Medicare or Medicaid, received food stamps, or received financial assistance. As these measures are highly correlated with low incomes, telephone subscription should be negatively correlated with these variables.

Also included in the analysis were marital status, home ownership status, and whether or not the household lived in a mobile home. Telephone subscription should be positively correlated with marriage and home ownership, as both are indicators of stability. Telephone subscription is expected to be negatively correlated with living in a mobile home, because of the lower income and greater mobility associated with mobile home living.

The price variables included the price of phone service, and the Lifeline and Link Up

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<sup>3</sup> *Reference Book of Rates, Price Indices, and Expenditures for Telephone Service*, 1998, Tracy Waldon. The prices in this edition are for October 1997.

<sup>4</sup> The logit regression model is a non-linear model in which a binomial (0 or 1) variable is regressed against an exponential function of the independent variables.

<sup>5</sup> The estimated poverty level for the household was a function of the number of people in the household.

discounts for which the household was eligible.<sup>6</sup> Telephone subscription should be negatively correlated with price and installation charges, and positively correlated with Lifeline and Link Up discounts. Several studies,<sup>7</sup> however, show that the demand for local telephone service is so inelastic that distinguishing the true coefficient from zero will be very difficult.

Tables 6.13 and 6.14 report the logit regression results. Not all the variables included in the original logit regressions were significant. Those variables that were not significant were omitted, and the logit regression re-run. The tables show the coefficients of the remaining variables. The variables of primary interest for this study are the coefficients on the Lifeline and Link Up discounts, and on the number of months that the state's DND rule was in effect.

Table 6.13 shows that the Lifeline program has a positive and significant impact on telephone subscribership, implying that increases in the Lifeline discount would increase telephone penetration. Unexpectedly, the Link Up program has a negative and significant coefficient. This would seem to imply that higher Link Up discounts are associated with lower telephone subscription rates. This nonsensical result may be a result of states increasing the Link Up discount in areas with low subscription rates. Table 6.13 also indicates that states with a DND policy have higher telephone penetration, and that the difference is statistically significant. Lastly, perhaps because the demand for telephone service is so inelastic, the price of phone service does not seem affect the telephone penetration level.

Because price data exist for only 8,408 observations (those households that live in cities selected by the Bureau of Labor Statistics for its Consumer Price Index survey), the price variables (price, Lifeline discount, Link Up discount) were omitted, and the logit regression was rerun for the entire 50,353 observation data set. Table 6.14 shows the results. In this logit regression, most of the variables had the expected signs. The income variable had a positive coefficient, and marriage and home ownership were positively correlated with telephone subscription as well. Telephone service was negatively correlated with food stamps, but positively correlated with "financial assistance." Again, the coefficient on the number of months that the state's DND policy was in effect was positive, and significant.

Because the above coefficients come from a logit regression, the impact of changing one of the variables (such as varying the number of months that states have maintained a DND policy) cannot be analyzed by simply multiplying the size of the change (such as from 0 to 60 months) by the coefficient. The impact must be measured in conjunction with the other variables.

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<sup>6</sup> Eligibility for each household was determined according to the eligibility guidelines reported in Table 2.4 of the 1997 *Monitoring Report*. For those households that appeared to be eligible for Lifeline or Link Up discounts, the actual value of the discount was used; when the household did not appear to be eligible for the programs, the value of zero was used.

<sup>7</sup> See, for example, Chapter 5 of *Telecommunications Demand in Theory and Practice*, 1994 by Lester Taylor, where most elasticity estimates for local service were close to zero.

Table 6.15 shows the probability that a household will have a telephone under three different scenarios: 1) the household has the average characteristics of those households that are phoneless; 2) the household has the same average characteristics from the first scenario, except that the variable "Number of Months DND Rule in Effect" has been set to zero; and 3) same as the first scenario, but the "Number of Months DND Rule in Effect" has been set to 60 months. By examining how the probability of this household having a telephone differs among the three scenarios, an estimate of the impact of DND policies can be created. The magnitude of the affect on a household's probability of having a telephone will vary, depending on that household's characteristics.<sup>8</sup> For instance, households with higher incomes will be affected differently than households with lower incomes. One prediction is certain, however: because the coefficient on "Number of Months DND Rule in Effect" is positive, instituting a DND rule will increase the probability that any given household will have telephone service.

Under the first scenario (a household with the characteristics of the average phoneless household, including living in a state where a DND policy has been in effect for just over 14 months), the household would have a 90.3% probability of having a telephone. Under the third scenario (which assumes the same household is in a state with a DND policy that has been in effect for 60 months), the probability of having a telephone would be 94.0%. Put into other words, this household's probability of being phoneless would decrease over 21%.<sup>9</sup>

Given that many states do not have DND policies, it is, perhaps, more interesting to estimate the effect of implementing a DND policy (for five years) in an area where there is no DND policy. The estimated size of the effect can be found using the second and third scenarios. In the second scenario, "Number of months DND Rule in Effect" has been set to zero, consistent with a state that does not have a DND policy. In such a state, the above household would have an 89.6% probability of having a telephone. As reported in the third column, after 60 months, the same household would have a 94.0% probability of having a telephone. Thus, the household's probability of being phoneless would be reduced 26.8% after a DND policy had been instituted for 60 months.

Table 6.16 shows the same scenarios as Table 6.15, except that the rightmost column (Number of months DND Rule in Effect) has been set to 120 months, to estimate the impact of a DND policy that has been in effect for ten years.<sup>10</sup> It shows that a household with the characteristics of the average phoneless household, and located in a state with a DND policy in place for 120 months, would be more than 40% less likely to be phoneless than if it were located in a state that had a DND policy in place for only 14 months. Further, if the same comparison were made between a state with a DND policy in place for 120 months and a state with no DND policy (zero months), the household in the state with the DND policy would be nearly 50% less likely to be phoneless.

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<sup>8</sup> It should be noted that such a household is hypothetical. For instance, this hypothetical household has 2.6 people living in it.

<sup>9</sup> The probability of being phoneless is one minus the probability of having phone service.



Finally, the results presented here appear to be robust. The above estimates of the impact of DND policies on phonelessness were calculated by using the average characteristics of phoneless households. The same type of analysis was performed, using the average characteristics across all households in the CPS sample (all 50,353 observations). The results (predicted reductions in phonelessness as a result of DND policies) were nearly identical to those presented above.

In summary, this preliminary study shows that both the Lifeline and DND policies have a positive and statistically significant affect on telephone subscribership. This study also shows a negative correlation between Link Up rates and telephone subscribership. This result is nonsensical, however, because lower connection costs should be associated with higher telephone subscribership. Research is continuing on the impact of these programs.

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<sup>10</sup> Several states had implemented DND policies more than 120 months before the March 1998 CPS data were collected, but indicated that it would be difficult pinpoint the exact month in which the policy was implemented. For this reason, the "number of months the DND rule has been in effect" was set equal to 120 months for all states with DND policies in effect for 120 months, or more. This allows for the possibility that a DND rule will be fully effective after 120 months.

Table 6.1

## Household Telephone Subscribership in the United States

Date		Households (millions)	Households with Telephones (millions)	Percentage with Telephones	Households without Telephones (millions)	Percentage without Telephones
November	1983	85.8	78.4	91.4%	7.4	8.6%
March	1984	86.0	78.9	91.8%	7.1	8.2%
July	1984	86.6	79.3	91.6%	7.3	8.4%
November	1984	87.4	79.9	91.4%	7.5	8.6%
March	1985	87.4	80.2	91.8%	7.2	8.2%
July	1985	88.2	81.0	91.8%	7.2	8.2%
November	1985	88.8	81.6	91.9%	7.2	8.1%
March	1986	89.0	82.1	92.2%	6.9	7.8%
July	1986	89.5	82.5	92.2%	7.0	7.8%
November	1986	89.9	83.1	92.4%	6.8	7.6%
March	1987	90.2	83.4	92.5%	6.8	7.5%
July	1987	90.7	83.7	92.3%	7.0	7.7%
November	1987	91.3	84.3	92.3%	7.0	7.7%
March	1988	91.8	85.3	92.9%	6.5	7.1%
July	1988	92.4	85.7	92.8%	6.7	7.2%
November	1988	92.6	85.7	92.5%	6.9	7.5%
March	1989	93.6	87.0	93.0%	6.6	7.0%
July	1989	93.8	87.5	93.3%	6.3	6.7%
November	1989	93.9	87.3	93.0%	6.6	7.0%
March	1990	94.2	87.9	93.3%	6.3	6.7%
July	1990	94.8	88.4	93.3%	6.4	6.7%
November	1990	94.7	88.4	93.3%	6.3	6.7%
March	1991	95.3	89.2	93.6%	6.1	6.4%
July	1991	95.5	89.1	93.3%	6.4	6.7%
November	1991	95.7	89.4	93.4%	6.3	6.6%
March	1992	96.6	90.7	93.9%	5.9	6.1%
July	1992	96.6	90.6	93.8%	6.0	6.2%
November	1992	97.0	91.0	93.8%	6.0	6.2%
March	1993	97.3	91.6	94.2%	5.7	5.8%
July	1993	97.9	92.2	94.2%	5.7	5.8%
November	1993	98.8	93.0	94.2%	5.8	5.8%
March	1994	98.1	92.1	93.9%	6.0	6.1%
July	1994	98.6	92.4	93.7%	6.2	6.3%
November	1994	99.8	93.7	93.8%	6.2	6.2%
March	1995	99.9	93.8	93.9%	6.1	6.1%
July	1995	100.0	94.0	94.0%	6.0	6.0%
November	1995	100.4	94.2	93.9%	6.2	6.1%
March	1996	100.6	94.4	93.8%	6.2	6.2%
July	1996	101.2	95.0	93.9%	6.1	6.1%
November	1996	101.3	95.1	93.9%	6.2	6.1%
March	1997	102.0	95.8	93.9%	6.2	6.1%
July	1997	102.3	96.1	93.9%	6.2	6.1%
November	1997	102.8	96.5	93.8%	6.3	6.2%
March	1998	103.4	97.4	94.1%	6.1	5.9%
July	1998	103.4	97.3	94.1%	6.1	5.9%
November	1998	104.1	98.0	94.2%	6.1	5.8%
March	1999	104.8	98.5	94.0%	6.3	6.0%
July	1999	105.1	99.2	94.4%	5.9	5.6%
November	1999	105.4	99.1	94.1%	6.3	5.9%

Details may not appear to add to totals due to rounding.

Chart 6.1

# Telephone Penetration

## Households

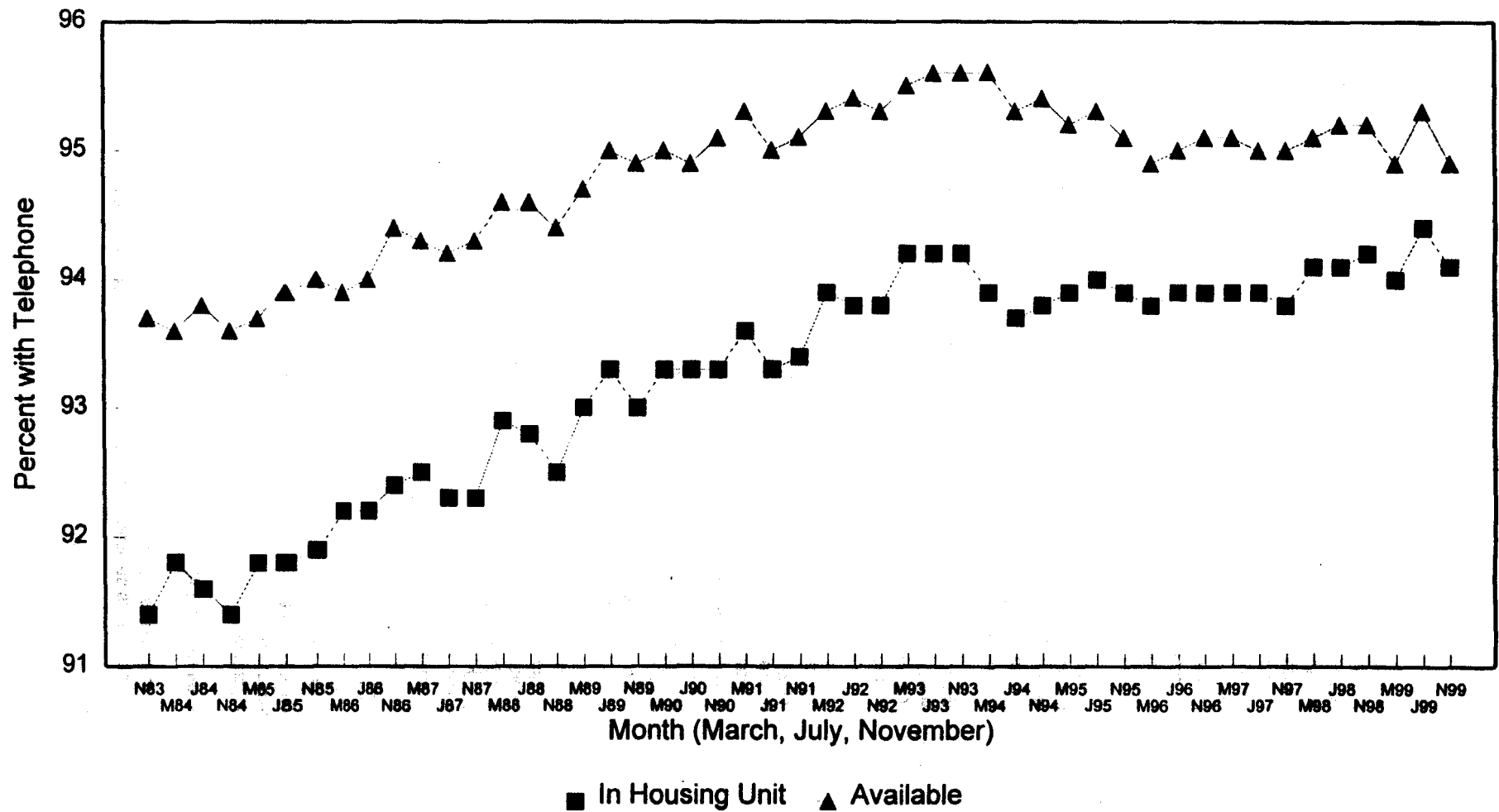


Table 6.2

**Telephone Penetration by State**  
(Annual Average Percentage of Households with Telephone Service)

State	1984	1999	Change
Alabama	88.4 %	91.5 %	3.0 % *
Alaska	86.5	94.6	8.1 *
Arizona	86.9	93.2	6.3 *
Arkansas	86.6	88.9	2.3
California	92.5	95.7	3.3 *
Colorado	93.2	96.7	3.5 *
Connecticut	95.5	96.5	1.0
Delaware	94.3	95.7	1.5
District of Columbia	94.9	92.4	-2.5 **
Florida	88.7	92.6	3.9 *
Georgia	86.2	92.1	5.9 *
Hawaii	93.5	96.3	2.8 *
Idaho	90.7	93.8	3.1 *
Illinois	94.2	91.8	-2.4 **
Indiana	91.6	93.8	2.3 *
Iowa	96.2	95.8	-0.4
Kansas	94.3	93.8	-0.5
Kentucky	88.1	92.8	4.6 *
Louisiana	89.7	91.5	1.9
Maine	93.4	97.2	3.8 *
Maryland	95.7	95.3	-0.4
Massachusetts	95.9	95.4	-0.5
Michigan	92.8	94.2	1.3
Minnesota	95.8	96.9	1.1
Mississippi	82.4	88.0	5.6 *
Missouri	91.5	95.6	4.1 *
Montana	91.0	95.3	4.3 *
Nebraska	95.7	95.9	0.2
Nevada	90.4	93.1	2.8
New Hampshire	94.3	97.0	2.7 *
New Jersey	94.8	93.9	-0.8
New Mexico	82.0	89.8	7.8 *
New York	91.8	95.3	3.5 *
North Carolina	88.3	93.9	5.6 *
North Dakota	94.6	97.3	2.6 *
Ohio	92.4	94.7	2.3 *
Oklahoma	90.3	91.2	0.9
Oregon	90.6	95.2	4.6 *
Pennsylvania	94.9	97.1	2.3 *
Rhode Island	93.6	94.3	0.6
South Carolina	83.7	92.9	9.3 *
South Dakota	93.2	92.7	-0.5
Tennessee	88.5	94.5	6.0 *
Texas	88.4	92.4	4.0 *
Utah	92.5	95.6	3.1 *
Vermont	92.3	95.3	3.1
Virginia	93.1	93.2	0.1
Washington	93.0	95.9	2.9 *
West Virginia	87.7	92.7	5.0 *
Wisconsin	95.2	95.7	0.5
Wyoming	89.9	95.0	5.2 *
Total United States	91.6	94.2	2.6 *

\* Increase is statistically significant at the 95% confidence level.

\*\* Decrease is statistically significant at the 95% confidence level.

Details may not appear to add to total due to rounding.

Chart 6.2

## Average 1999 Telephone Penetration

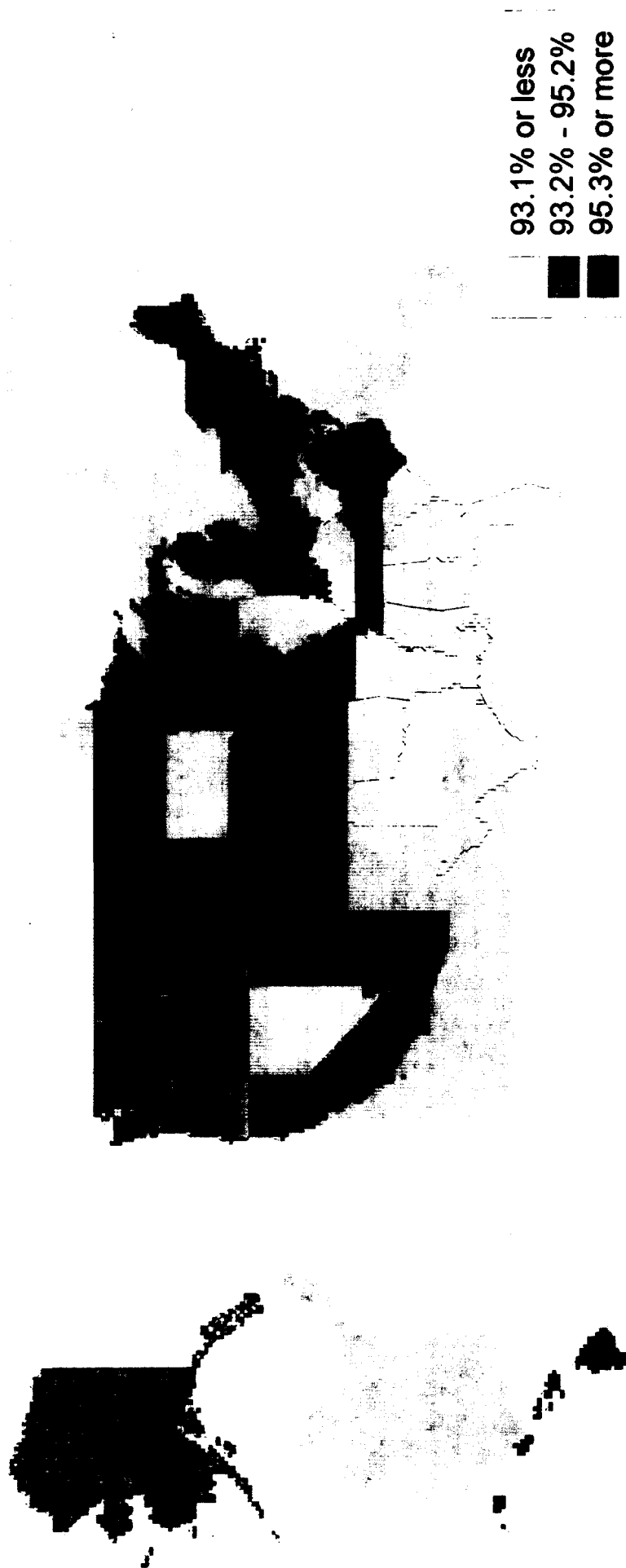


Chart 6.3

## 1984 - 1999 Penetration Changes



Chart 6.4

# Telephone Penetration by Income Level Average 1999

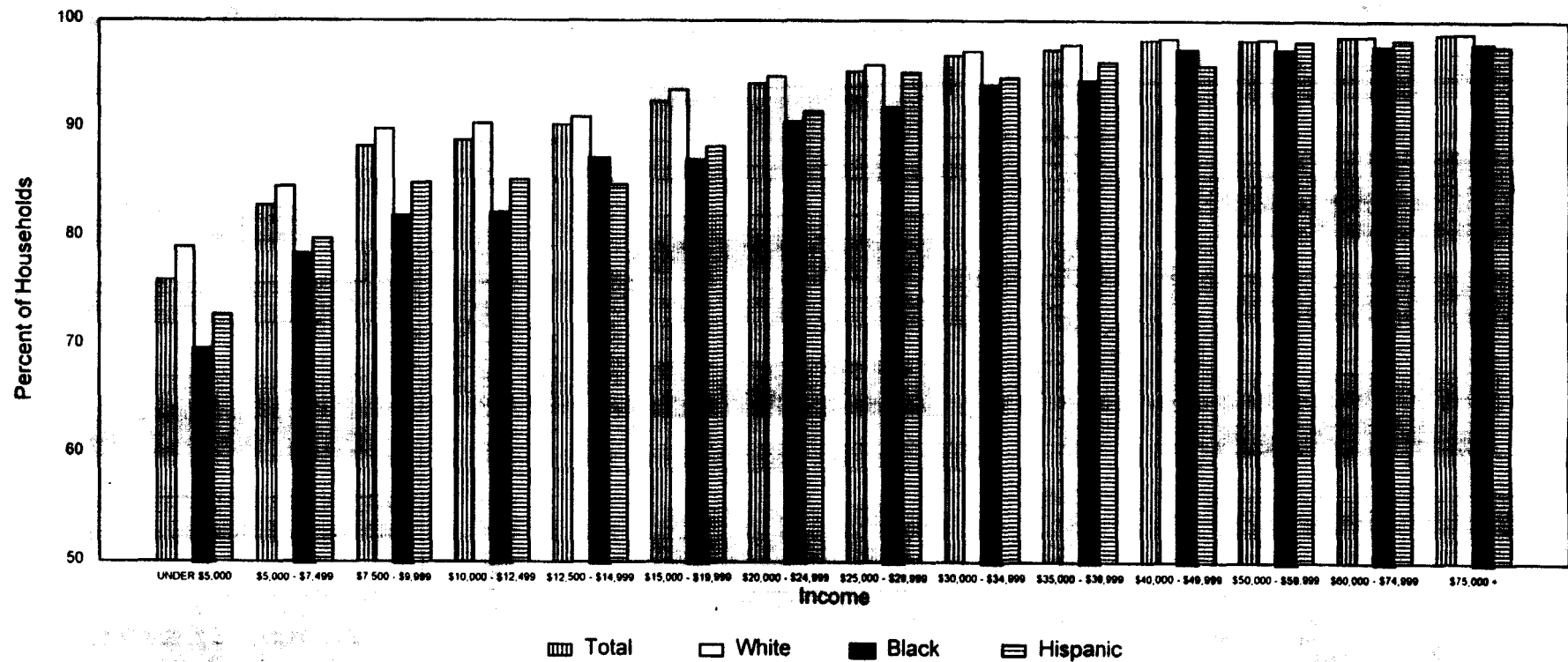


Chart 6.5

### Telephone Penetration by Household Size

Average 1999

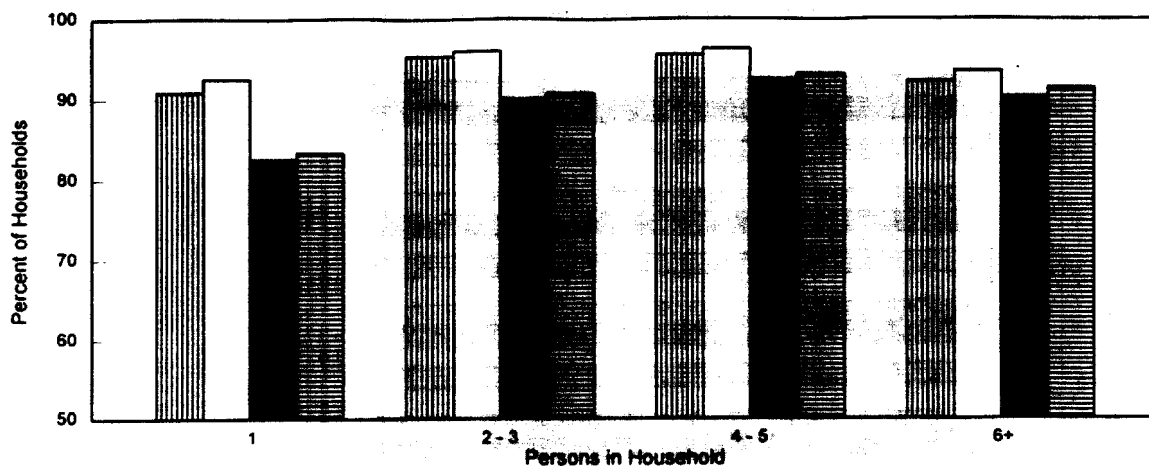


Chart 6.6

### Telephone Penetration by Householder's Age

Average 1999

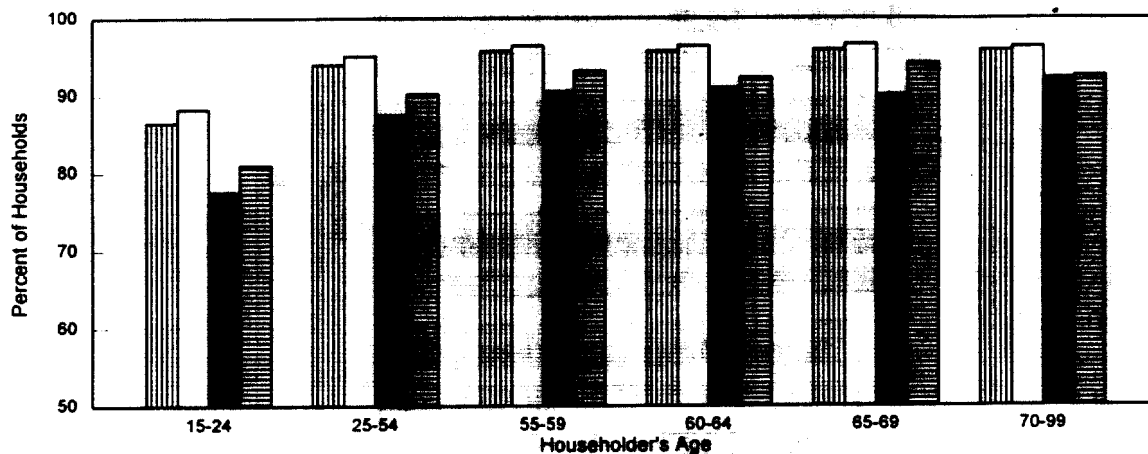


Chart 6.7

### Telephone Penetration by Labor Force Status

Average 1999

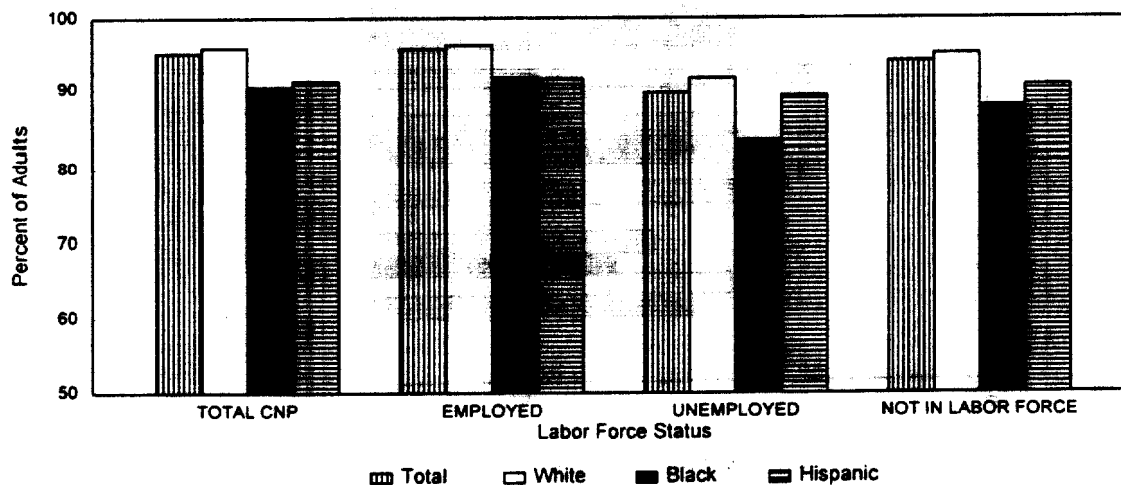




Chart 6.8

# Telephone Penetration Civilian Noninstitutionalized Adults

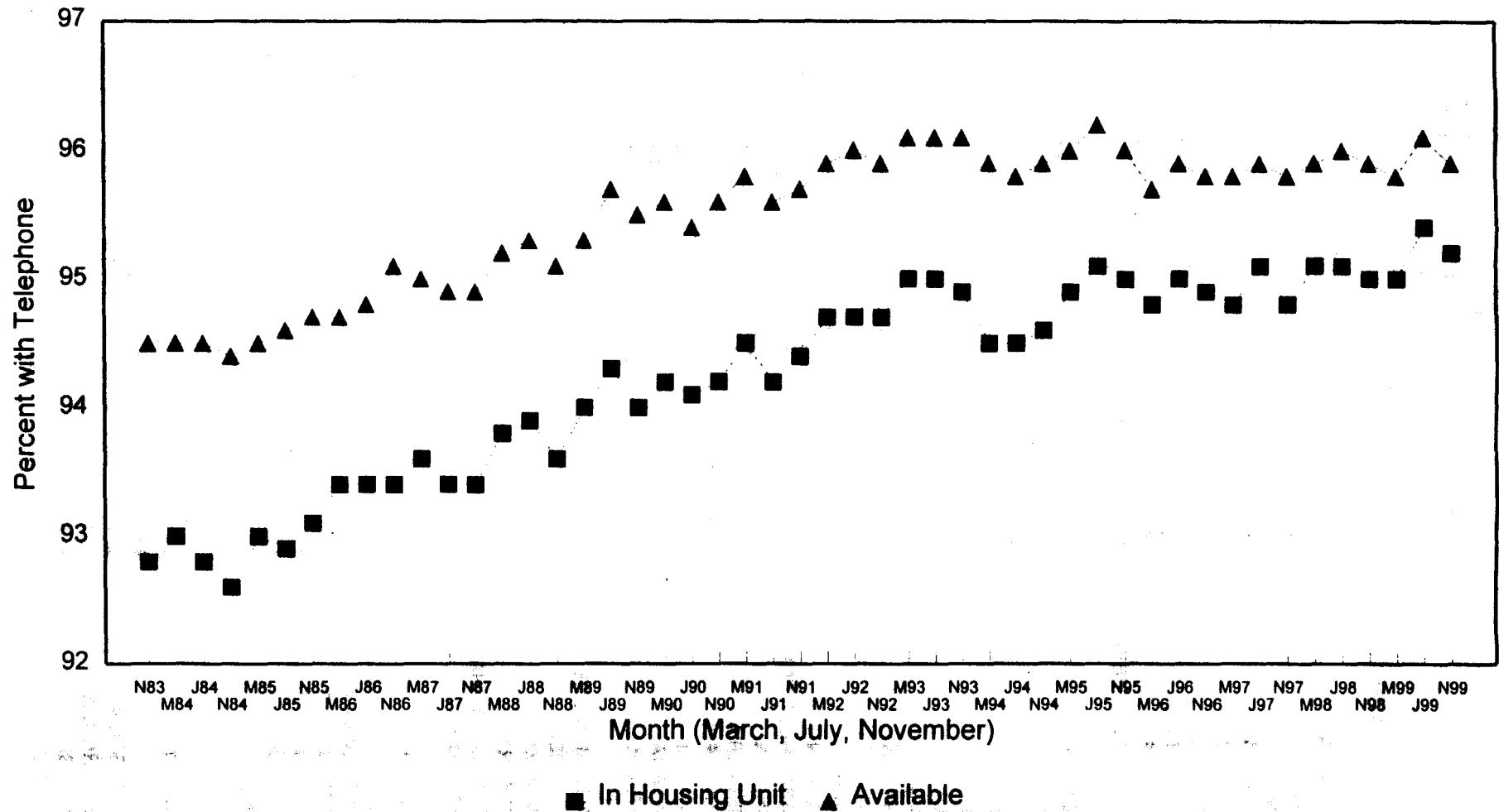


TABLE 6.3 - PERCENTAGE OF HOUSEHOLDS WITH A TELEPHONE BY STATE

	1983		1984		1985		1986	
	NOVEMBER Unit	Avail	ANNUAL AVERAGE Unit	Avail	ANNUAL AVERAGE Unit	Avail	ANNUAL AVERAGE Unit	Avail
<b>UNITED STATES</b>	91.4	93.7	91.6	93.7	91.8	93.9	92.3	94.1
ALABAMA	87.9	90.2	88.4	90.5	89.1	91.0	88.7	90.4
ALASKA	83.8	88.8	86.5	89.0	87.1	89.5	86.4	88.9
ARIZONA	88.8	90.7	86.9	89.4	87.3	89.6	89.4	90.9
ARKANSAS	88.2	91.4	86.6	90.6	85.9	89.9	86.4	90.4
CALIFORNIA	91.7	93.5	92.5	93.8	92.9	94.1	93.0	94.0
COLORADO	94.4	96.5	93.2	95.4	94.3	96.2	94.1	96.0
CONNECTICUT	95.5	98.4	95.5	97.0	96.2	97.6	97.0	97.9
DELAWARE	95.0	96.6	94.3	95.7	94.8	96.2	94.7	96.3
DIST OF COLUMBIA	94.7	95.6	94.9	96.3	93.6	95.2	92.2	94.0
FLORIDA	85.5	89.9	88.7	91.3	89.6	91.7	90.0	92.5
GEORGIA	88.9	92.1	86.2	89.1	87.6	89.7	88.4	91.0
HAWAII	94.6	96.4	93.5	94.9	93.0	95.0	92.2	94.4
IDAHO	89.5	92.2	90.7	91.7	91.8	93.1	91.5	93.1
ILLINOIS	95.0	95.9	94.2	95.8	93.7	95.3	93.6	95.2
INDIANA	90.3	93.5	91.6	93.6	92.3	94.7	92.2	94.3
IOWA	95.4	97.2	96.2	97.4	95.1	96.4	95.7	96.5
KANSAS	94.9	96.7	94.3	95.8	94.4	96.4	94.6	96.1
KENTUCKY	86.9	90.9	88.1	91.0	87.4	91.1	86.2	90.6
LOUISIANA	88.9	93.3	89.7	92.7	90.3	93.6	88.7	91.9
MAINE	90.7	93.1	93.4	95.3	94.0	95.6	93.4	95.4
MARYLAND	96.3	96.7	95.7	96.5	95.5	96.7	95.7	96.7
MASSACHUSETTS	94.3	95.9	95.9	96.9	95.2	96.3	96.4	97.1
MICHIGAN	93.8	94.9	92.8	94.5	92.9	94.2	93.4	94.5
MINNESOTA	96.4	97.5	95.8	97.1	96.4	97.4	96.2	97.2
MISSISSIPPI	82.4	89.1	82.4	87.5	80.9	87.6	80.1	87.3
MISSOURI	92.1	94.1	91.5	93.7	92.5	94.8	93.4	94.9
MONTANA	92.8	94.5	91.0	94.0	91.4	93.9	90.9	93.7
NEBRASKA	94.0	95.3	95.7	96.8	95.3	96.6	95.6	96.8
NEVADA	89.4	91.9	90.4	92.8	91.8	93.8	92.4	93.7
NEW HAMPSHIRE	95.0	96.9	94.3	95.8	93.2	94.6	94.0	95.0
NEW JERSEY	94.1	95.1	94.8	96.1	94.9	96.2	94.9	96.1
NEW MEXICO	85.3	90.9	82.0	87.0	84.1	88.2	85.1	89.1
NEW YORK	90.8	92.2	91.8	93.6	92.1	93.6	93.2	94.3
NORTH CAROLINA	89.3	92.9	88.3	91.9	89.4	92.4	90.2	92.5
NORTH DAKOTA	95.1	97.3	94.6	96.8	95.3	96.7	96.1	97.0
OHIO	92.2	93.9	92.4	94.4	92.2	94.5	93.1	94.4
OKLAHOMA	91.5	93.7	90.3	92.5	88.8	91.7	90.4	93.0
OREGON	91.2	93.5	90.6	92.3	90.3	92.1	92.7	94.3
PENNSYLVANIA	95.1	97.1	94.9	96.5	95.3	96.6	96.3	97.4
RHODE ISLAND	93.3	94.6	93.6	94.6	94.0	95.1	95.9	96.8
SOUTH CAROLINA	81.8	84.9	83.7	87.7	86.8	90.5	86.3	90.6
SOUTH DAKOTA	92.7	95.0	93.2	94.9	92.6	94.5	92.6	94.2
TENNESSEE	87.6	92.6	88.5	92.0	89.3	92.6	89.6	93.6
TEXAS	89.0	92.6	88.4	91.6	88.1	91.6	88.9	91.9
UTAH	90.3	92.2	92.5	94.2	93.9	95.1	93.0	93.9
VERMONT	92.7	94.3	92.3	94.0	92.9	94.1	93.8	95.6
VIRGINIA	93.1	94.7	93.1	95.1	91.7	93.8	92.1	94.1
WASHINGTON	92.5	93.7	93.0	94.4	94.7	96.2	94.6	96.3
WEST VIRGINIA	88.1	91.1	87.7	91.8	87.6	91.7	88.2	91.9
WISCONSIN	94.8	96.1	95.2	96.6	94.1	95.4	95.1	95.9
WYOMING	89.7	93.3	89.9	92.8	93.4	94.9	92.1	95.1